Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1-4. (Canceled)

5. (Withdrawn) A simulation system comprising:

an atmospheric radiance and transmission modeling module;

an atmospheric conditions source connected to the atmospheric radiance and
transmission modeling module;

a sensor response removal module;

a field data source connected to the sensor response removal module;

a sensor response source connected to the sensor response removal module;

a special characteristics addition module connected to the sensor response
removal module;

an atmospheric attenuation module connected to the atmospheric radiance and
transmission modeling module and to the special characteristics addition
module; and

a sensor response addition module connected to the sensor response source and to
the atmospheric attenuation module.

6. (Withdrawn) The system of claim 5, wherein the sensor response addition has
a simulated data output.

7. (Currently Amended) A computer system operable as a simulator system, the
computer system comprising:

a chemical agent detection environment simulation device;

a user interface connected to the chemical agent detection environment simulation
device;

a background measurement environment interferogram source connected to the
chemical agent detection environment simulation device;

a numerical computing tool connected to the chemical agent detection
environment simulation device; and

an atmospheric transmittance and radiance model connected to the chemical agent
detection environmental simulation device.

8. (Original) The system of claim 7, further comprising an ancillary information
source connected to the chemical agent detection environment simulation device.

9. (Original) The system of claim 8, wherein:

files may be input to the atmospheric transmittance and radiance model from the
chemical agent detection simulation device environment; and

atmospheric model information may be input to the chemical agent detection
environment simulation device from the atmospheric transmittance and
radiance model.

10. (Withdrawn) A simulation method comprising:

computing parameters of a plurality of parameters of spectrums;

calibrating a background spectrum;

constructing an atmospheric model;

construction a cloud model; and

building simulated spectra from the plurality of parameters of spectrums, the
background spectrum, the atmospheric model and the cloud model.

11. (Withdrawn) The method of claim 10 further comprising signal-to-noise
compensation of the simulated spectrum.

12. (Withdrawn) A means for simulating comprising:

means for computing parameters for at least one spectrum;

means for calibrating a background spectrum;

means for constructing an atmospheric model;

means for constructing a cloud model;

means for simulating a signature from the at least one spectrum, the background

        spectrum, the atmospheric model and the cloud model.

13. (Withdrawn) The means of claim 12, further comprising a means for improving a signal-to-noise factor of the signature.

14. (Withdrawn) A system for simulation comprising:

a user interface;

an atmospheric simulation module connected to the user interface;

a sensor radiation and response module connected to the user interface;

a cloud radiance and transmittance module; and

a synthesizer connected to the atmospheric simulation module, the sensor

        radiation and response module, and the cloud radiance and transmittance

        module.

15. (Withdrawn) The system of claim 14, further comprising a data storage module connected to the synthesizer.

16. (Withdrawn) The system of claim 15, wherein the sensor radiation and response module, the cloud radiance and transmittance module and the synthesizer are operated with a numerical computing tool.

17. (Withdrawn) The system of claim 16, wherein the numerical computing tool is a Matlab® module.

18. (Withdrawn) The system of claim 16, wherein the atmospheric simulation module is a MODTRAN module.

19. (Withdrawn) A signature simulator comprising:

an input stage;

a preparation stage;

a calibration stage; and

a simulation stage; and

wherein the simulation stage comprises:

a background spectrum;

an atmospheric model;

a cloud model; and

a simulated spectrum builder.

20. (Withdrawn) The simulator of claim 19 wherein calibration stage comprises:

computing an ambient blackbody spectrum;

computing a theoretical ambient blackbody spectrum; and

computing a calibrated background spectrum.

21. (Withdrawn) The simulator of claim 20, wherein the calibration stage further comprises computing an LN_2 reference spectrum.

22. (Withdrawn) The simulator of claim 21, wherein the simulated spectrum builder may output a simulated signature.

23. (Previously Presented) The system of claim 7, wherein the chemical agent detection environment simulation device includes simulated sensor output.

24. (Previously Presented) The system of claim 23, wherein the numerical computing tool is configured to test the sensor output with one or more algorithms.

25. (Previously Presented) The system of claim 7, further comprising a cloud radiance and transmittance module.

26. (Previously Presented) The system of claim 7, wherein the numerical computing tool is a Matlab® module.

27. (Previously Presented) The system of claim 7, wherein the atmospheric transmittance and radiance module is a MODTRAN module.

28. (Previously Presented) The system of claim 7, wherein the chemical agent detection environment simulation device includes:

    an input stage;

    a preparation stage;

    a calibration stage; and

    a simulation stage; and

wherein the simulation stage comprises:

    a background spectrum;

    an atmospheric model;

    a cloud model; and

    a simulated spectrum builder.

29. (Previously Presented) The system of claim 28 wherein the calibration stage comprises:

computing an ambient blackbody spectrum;

computing a theoretical ambient blackbody spectrum; and

computing a calibrated background spectrum.

30. (Currently Amended) The system of claim 29, wherein the calibration stage is configured to compute [[an]] a liquid nitrogen (LN$_2$) reference spectrum.

31. (Previously Presented) The system of claim 7, further comprising a sensor response removal module.

32. (Previously Presented) The system of claim 31, further comprising a field data source and a sensor response source each connected to the sensor response removal module.